

CLAIMS

1. An infrared ray lamp comprising:

two or more heating elements each having a long shape
5 with at least one flat face and generating heat by virtue
of application of a voltage,

heating element holding means that disposes said
heating elements in parallel so as to have a desired space
therebetween and so that said flat faces of said heating
10 elements are oriented in the same direction,

a glass tube in which said heating elements and said
heating element holding means are sealed, and

lead wire portions electrically connected to said
heating elements and derived from the sealed portions of
15 said glass tube.

2. An infrared ray lamp comprising:

two or more heating elements each having a long shape
with at least one flat face and generating heat by virtue
20 of application of a voltage,

heating element holding means that disposes said
heating elements in parallel so as to have a desired space
therebetween and so that said flat faces of said heating
elements have a predetermined angle with respect to a
25 reference face,

a glass tube in which said heating elements and said heating element holding means are sealed, and

lead wire portions electrically connected to said heating elements and derived from the sealed portions of
5 said glass tube.

3. The infrared ray lamp according to claim 1 or 2, wherein the cross-sectional shape of said heating elements, cross-sectioned in a direction orthogonal to the
10 longitudinal direction thereof, is a substantially polygonal shape, and said flat faces having the largest area in said heating elements are disposed so as to be oriented in the same direction.

15 4. The infrared ray lamp according to claim 1 or 2, wherein the end faces of said heating elements, cross-sectioned in a direction orthogonal to the longitudinal direction thereof, is formed by a straight line and an arc line, and said flat faces of said heating elements are
20 disposed so as to be oriented in the same direction.

5. The infrared ray lamp according to claim 1 or 2, wherein said heating element holding means comprises holding blocks having thermal conductivity and a spacer
25 having electric insulation, and said flat faces of said

heating elements are disposed so as to be oriented in the same direction by securing said heating elements into slits formed in said holding blocks and by fitting said holding blocks into cutouts formed in said spacer.

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6. The infrared ray lamp according to any one of claims 1 to 5, wherein said heating elements are carbonaceous heating elements including a carbonaceous substance and formed by firing.

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7. The infrared ray lamp according to any one of claims 1 to 5, wherein said heating elements are solid carbonaceous heating elements inclining a carbonaceous substance and a resistance adjustment substance, and formed by firing.

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8. A heating apparatus comprising an infrared ray lamp having:

two or more heating elements each having a long shape with at least one flat face and generating heat by virtue of application of a voltage,

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heating element holding means that disposes said heating elements in parallel so as to have a desired space therebetween and so that said flat faces of said heating elements are oriented in the same direction,

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a glass tube in which said heating elements and said

heating element holding means are sealed, and

lead wire portions electrically connected to said heating elements and derived from the sealed portion of said glass tube, and said heating apparatus further

5 comprising:

a reflector disposed so as to be opposed to said flat faces of said heating elements.

9. The heating apparatus according to claim 8, wherein
10 the cross-sectional shape of said reflector, cross-sectioned in the direction orthogonal to the longitudinal direction thereof, has a convex portion protruding at the central portion of the reflection face thereof in the direction opposed to said flat faces of said heating
15 elements.

10. The heating apparatus according to claim 9, wherein said convex portion formed on said reflection face is configured so that the heat rays from said heating elements
20 are not radiated to said heating elements.

11. The heating apparatus according to claim 8, wherein the cross-sectional shape of said reflector, cross-sectioned in the direction orthogonal to the longitudinal
25 direction thereof, is a parabolic shape, and the

substantially central point of heating in a heating element group consisting of said plural heating elements is disposed at the position of the focal point of said parabola.

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12. The heating apparatus according to claim 8, wherein the cross-sectional shape of said reflector, cross-sectioned in the direction orthogonal to the longitudinal direction thereof, is a combination shape of plural
10 parabolas, and the substantially central point of heating in each heating element is disposed at the position of the focal point of each parabola.

13. The heating apparatus according to claim 8, wherein
15 the cross-sectional shape of said reflector, cross-sectioned in the direction orthogonal to the longitudinal direction thereof, has a convex face protruding in a direction being opposed to said flat faces of said heating elements at the central portion of the reflection face
20 thereof, and is configured so that the heat rays from said heating elements are diffusely reflected by said convex face.

14. The heating apparatus according to claim 8, wherein
25 the cross-sectional shape of said reflector, cross-

sectioned in the direction orthogonal to the longitudinal direction thereof, has a concave-convex face positioned so as to be opposed to said flat faces of said heating elements at the central portion of said reflection face thereof, and so that the heat rays from said heating elements are diffusely reflected by said concave-convex face.

15. A heating apparatus comprising an infrared ray lamp having:

two or more heating elements each having a long shape with at least one flat face and generating heat by virtue of application of a voltage,

heating element holding means that disposes said heating elements in parallel so as to have a desired space therebetween and so that said flat faces of said heating elements are oriented in the same direction,

a glass tube in which said heating elements and said heating element holding means are sealed,

lead wire portions electrically connected to said heating elements and derived from the sealed portions of said glass tube, and said heating apparatus further comprising:

a reflection film formed on said glass tube at a position opposed to said flat faces of said heating

elements.

16. A heating apparatus comprising an infrared ray lamp having:

5 two or more heating elements each having a long shape with at least one flat face and generating heat by virtue of application of a voltage,

 heating element holding means that disposes said heating elements in parallel so as to have a desired space
10 therebetween and so that said flat faces of said heating elements are oriented in the same direction,

 a glass tube in which said heating elements and said heating element holding means are sealed,

 lead wire portions electrically connected to said
15 heating elements and derived from the sealed portions of said glass tube, and said heating apparatus further comprising:

 a cylinder having a cylindrical shape and disposed so at to cover said heating elements.

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17. The heating apparatus according to any one of claims 8 to 16, further comprises:

 two or more external terminals respectively connected to said plural heating elements,

25 two or more power source terminals connected to a

power source, and

a control circuit that selectively connects said external terminals to said power source terminals so that said heating elements are connected in series or parallel
5 or connected independently.

18. The heating apparatus according to claim 17, wherein said control circuit is configured so that circuits for ON-OFF control, power application ratio control, phase control
10 and zero-cross control are used independently or at least two of said circuits are used in combination.

19. The heating apparatus according to any one of claims 8 to 16, wherein said heating elements are carbonaceous
15 heating elements including a carbonaceous substance and formed by firing.

20. The heating apparatus according to any one of claims 8 to 16, wherein said heating elements are solid carbonaceous
20 heating elements including a carbonaceous substance and a resistance adjustment substance, and formed by firing.